

Receipt date: 02/23/2007



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heng Tsai, et al.

Serial No: 10/583,179

Filed: June 16, 2006

Title: PROTEIN SEPARATION DEVICE

Docket No: 490352-3004

Group Art Unit: 2161

Examiner:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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KJ Rostberg

2/20/07
Date

INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. § 1.56, § 1.97 and § 1.98, Applicant brings the references listed on the attached Form PTO-1449 to the examiner's attention. These references may be material to examination of the above-identified application. Please do not construe the filing of this information disclosure statement as a representation that applicant has made a search (37 C.F.R. § 1.97(g)), or as an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

This Information Disclosure Statement is being submitted:

- ☒ 1. Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; or before the mailing date of a first office action on the merits, or before the mailing of a first office action after filing of a request for continued examination under 37 CFR 1.114, and therefore, Applicant believes no fee is required;
- ☐ 2. After the period specified in paragraph (1) hereinabove of this section, but is being filed before the mailing date of either a final action under 37 CFR 1.113, or a notice of

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allowance under 37 CFR 1.311, or an action that otherwise closes prosecution in the application, and is accompanied by one of the following:

- ☐ (a) A statement that either:
- (i) Each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement;

OR

- (ii) No item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement;

OR

- ☐ (b) The fee of \$180 for filing of an Information Disclosure Statement as set forth in 37 C.F.R. 1.17(p).

- ☐ 3. After the period specified in paragraph (2) of this section, but is filed on or before payment of the issue fee and is accompanied by both:

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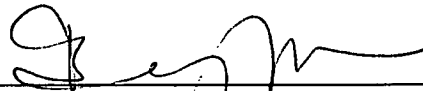
Applicant would appreciate the Examiner initialing and signing a copy of Form PTO-1449, transmitted herewith, indicating that the information has been considered and made of record herein.

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In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-1901** referencing order number 490352-3004.

Respectfully submitted,

By



Barbara A. Wrigley, Reg. No. 34,950

Customer No. 34205

Oppenheimer Wolff & Donnelly LLP

45 So. Seventh St., Ste. 3300

Minneapolis, Minnesota 55402

(612) 607-7595

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|------------------------|----------------------|
| Application Number | PCT/SG2004/000417 |
| Filing Date | December 17, 2004 |
| First Named Inventor | Heng Hang TSAI et al |
| Art Unit | not assigned yet |
| Examiner Name | not assigned yet |
| Attorney Docket Number | 490352-3004/US |

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| FOREIGN PATENT DOCUMENTS | | | | | | |
|--------------------------|-----------------------|---|------------------|---|---|--------------------------|
| Examiner Initials * | Cite No. ¹ | Foreign Patent Document | Publication Date | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear | T ⁶ |
| | | Country Code ³ Number ⁴ Kind Code ⁵ (if known) | MM-DD-YYYY | | | |
| | B1 | WO 2002/083725, A1 | 10-24-2002 | RNA INC. et al. | | <input type="checkbox"/> |
| | B2 | WO 2003/048783, A1 | 06-12-2003 | POSTON ROBIN | | <input type="checkbox"/> |
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| | | Filing Date | December 17, 2004 |
| | | First Named Inventor | Hen Hang TSAI et al. |
| | | Art Unit | not yet assigned |
| | | Examiner Name | not yet assigned |
| Sheet 2 | of 4 | Attorney Docket Number | 490352-3004/US |

| NON PATENT LITERATURE DOCUMENTS | | | |
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| | C1 | AGARD, D.A., "To fold or not to fold", Science, (1993) p. 1903-1904, Vol. 260. | <input type="checkbox"/> |
| | C2 | ALTSCHUL, S.F., et al., "Basic Local Alignment Search Tool", J. Mol. Biol., (1990) p. 403-410, Vol. 215. | <input type="checkbox"/> |
| | C3 | AUSUBEL, et al. (eds), Current Protocols in Molecular Biology, (1989) p. 2.10.3, Vol. 1, Green Publishing Associates, Inc. and John Wiley & Sons, Inc., New York. | <input type="checkbox"/> |
| | C4 | BHUTANI, N., et al., "Chaperonins as protein-folding machines", Current Science, (2002) p. 1337-1351, Vol. 83, No. 11. | <input type="checkbox"/> |
| | C5 | BRAZIL, B.T., et al., "Model Peptide Studies Demonstrate That Amphipathic Secondary Structures Can Be Recognized by the Chaperonin GroEL (cpn60)", J. Biol. Chem., (1997) p. 5105-5111, Vol. 272, No. 8. | <input type="checkbox"/> |
| | C6 | BUKAU, B., et al., "The Hsp70 and Hsp60 Chaperone Machines", Cell, (1998) p. 351-366, Vol. 92. | <input type="checkbox"/> |
| | C7 | CHATELLIER, J., et al., "GroEL Recognises Sequential and Non-sequential Linear Structural Motifs Compatible with Extended β -Strands and α -Helices", J. Mol. Biol., (1999) p. 163-172, Vol. 292. | <input type="checkbox"/> |
| | C8 | CHAUDHURI, T.K., et al., "GroEL/GroES-Mediated Folding of a Protein Too Large to Be Encapsulated", Cell, (2001) p. 235-246, Vol. 107. | <input type="checkbox"/> |
| | C9 | DeBBURMAN, S.K., et al., "Chaperone-supervised conversion of prion protein to its protease-resistant form", Proc. Natl. Acad. Sci. U.S.A., (1997) p. 13938-13943, Vol. 94, No. 25. | <input type="checkbox"/> |
| | C10 | ERBSE, A., et al., "A folding machine for many but a master of none", Nature Structural Biology, (2003) p. 84-86, Vol. 10, No. 2. | <input type="checkbox"/> |
| | C11 | GÉMINARD, et al., "Characteristics of the interaction between Hsc70 and the transferrin receptor in exosomes released during reticulocyte maturation", J. Biological Chem., (2001) p. 9910-9916, Vol. 276. | <input type="checkbox"/> |
| | C12 | HARTL, F.U., et al., "Molecular Chaperones in the Cytosol: from Nascent Chain to Folded Protein", Science, (2002) p. 1852-1858, Vol. 295. | <input type="checkbox"/> |
| | C13 | HEMMINGSEN, S.M., "What is a chaperonin?", Nature, (1992) p. 650, Vol. 357, No. 6380. | <input type="checkbox"/> |
| | C14 | HOURY, W.A., "Mechanism of substrate recognition by the chaperonin GroEL", Biochem. Cell Biol., (2001) p. 569-577, Vol. 79, © 2001 NRC Canada. | <input type="checkbox"/> |

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| | | First Named Inventor | Hen Hang TSAI et al. | | |
| | | Art Unit | not yet assigned | | |
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| Sheet | 3 | of | 4 | Attorney Docket Number | 490352-3004/US |

| NON PATENT LITERATURE DOCUMENTS | | | |
|---------------------------------|-----------------------|--|--------------------------|
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| | C15 | HYNES, et al., "Individual subunits of the eukaryotic cytosolic chaperonin mediate interactions with binding sites located on subdomains of β -actin", J. Biological Chem., (2000) p. 18965-18994, Vol. 275. | <input type="checkbox"/> |
| | C16 | KINBARA, K., et al., "RAS GTPases: INTEGRINS' FRIENDS OR FOES?", Nature Reviews: Molecular Cell Biology, (2003) p. 767-776, Vol. 4. | <input type="checkbox"/> |
| | C17 | KLUMPP, M., et al., "Structure of the Substrate Binding Domain of the Thermosome, an Archaeal Group II Chaperonin", Cell, (1997) p. 263-270, Vol. 91. | <input type="checkbox"/> |
| | C18 | NADEAU, et al., "Hsp90 chaperonins possess ATPase activity and bind heat shock transcription factors and peptidyl propyl isomerases", J. Biological Chem., (1993) p. 1479-1487, Vol. 268. | <input type="checkbox"/> |
| | C19 | NAM, et al., "Affinity Purification and characterization of the Escherichia coli molecular chaperones", Protein Expression and Purification, (2002) p. 282-291, Vol. 24. | <input type="checkbox"/> |
| | C20 | NEEDLEMAN, et al., "A General Method Applicable to the Search for Similarities in the Amino Acid Sequence of Two Proteins", J. Mol. Biol., (1970) p. 443-453, Vol. 48. | <input type="checkbox"/> |
| | C21 | NIELSEN, K.L., et al., "A Single-Ring Mitochondrial Chaperonin (Hsp60-Hsp10) Can Substitute for GroEL-GroES In Vivo", Journal of Bacteriology, (1999) p. 5871-5875, Vol. 181, No. 18. | <input type="checkbox"/> |
| | C22 | PEARSON, W.R., et al., "Improved tools for biological sequence comparison", Proc. Natl. Acad. Sci. USA, (1988) p. 2444-2448, Vol. 85. | <input type="checkbox"/> |
| | C23 | SAKIKAWA, C., et al., "On the Maximum Size of Proteins to Stay and Fold in the Cavity of GroEL underneath GroES", J. Biol. Chem., (1999) p. 21251-21256, Vol. 274, No. 30, Issue of July 23. | <input type="checkbox"/> |
| | C24 | SEALE, J.W., et al., "Preformed GroES Oligomers Are Not Required as Functional Cochaperonins", Journal of Protein Chemistry, (1997) p. 661-668, Vol. 16, No. 7. | <input type="checkbox"/> |
| | C25 | SMITH, et al., "Comparison of Biosequences", Adv. Appl. Math., (1981) p. 482-489, Vol. 2. | <input type="checkbox"/> |
| | C26 | STANIFORD, R.A., et al., "The stability and hydrophobicity of cytosolic and mitochondrial malate dehydrogenases and their relation to chaperonin-assisted folding", FEBS Letters, (1994) p. 129-135, Vol. 344. | <input type="checkbox"/> |
| | C27 | STRAUB, et al., "Genotyping Cryptosporidium parvum with an hsp 70 single-nucleotide polymorphism microarray", Applied and Environmental Microbiology, (2002) p. 1817-1826, Vol. 68. | <input type="checkbox"/> |
| | C28 | TAGUCHI, H., et al., "Single-molecule observation of protein-protein interactions in the chaperonin system", Nature Biotechnology, (2001) p. 861-865, Vol. 19. | <input type="checkbox"/> |

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| | C29 | TELL, et al. "Comparison of four rapid DNA extraction techniques for conventional polymerase chain reaction testing of three mycobacterium spp. that affects birds", Avian Diseases, (Oct. 2003) p. 1486-1490, Vol. 47. | <input type="checkbox"/> |
| | C30 | TIJSEN, "Overview of principles of hybridization and the strategy of nucleic acid probe assays", Laboratory Techniques in Biochemistry and Molecular Biology -- Hybridization with Nucleic Acid Probes, (1993) Part I, Chapter 2, Elsevier, New York. | <input type="checkbox"/> |
| | C31 | WANG, Z., et al., "Basis of Substrate Binding by the Chaperonin GroEL", Biochem., (1999) p. 12537-12546, Vol. 38. | <input type="checkbox"/> |
| | C32 | XU, Z., et al., "The crystal structure of the asymmetric GroEL-GroES-(ADP) ₇ chaperonin complex", Nature, (1997) p. 741-750, Vol. 388. | <input type="checkbox"/> |
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